REMARKS:

Claim 7 has been objected to under 37 C.F.R. §1.75(c) as being of improper dependent form for failure to further limit the subject matter of claim 1 on which it was dependent. This objection has been rendered moot by virtue of the fact that claim 7 has been canceled.

Claims 1-18 were rejected under 35 U.S.C. §103(a) as being obvious over the teachings of Lin et al (United States Patent 6,608,145) in view of Asahara (United States Patent 5,532,319). However, claim 1 has been further amended in a manner that more clearly distinguishes it from the teachings of Lin in view of Asahara. More specifically, claim 1 has been amended to make it clear that (1) the maximum temperature at which the silica, silica coupling agent, and the low molecular weight end-group functionalized diene rubber are dispersed through the conventional rubbery polymer is 130°C, (2) the silica, the silica coupling agent, and the low molecular weight end-group functionalized diene rubber are dispersed through the conventional rubbery polymer in an organic solvent, and (3) the possibility of the low molecular weight end-group functionalized diene rubber being a block copolymer is precluded.

The Examiner pointed out that Lin discloses a process wherein various components of the sulfur-vulcanizable elastomer utilized therein are added at a temperature of 165°C to about 200°C with a final mixing step being carried out within a preferred range of about 40°C to about 120°C. Accordingly, the Examiner further noted that at least the final mixing step temperature of Lin overlaps the presently claimed temperature range. The Examiner is taking the position that the open-ended transitional phrase "comprising" in claim 1 does not preclude the possibility of there being an additional method step which utilizes a temperature within the range of 165°C to about 200°C called for by Lin. Claim 1 has been amended to preclude such a possibility by calling for the silica, the silica coupling agent, and the low molecular weight end-group functionalized diene rubber to be dispersed throughout the cement of the conventional rubbery polymer at a maximum temperature of 130°C. Accordingly, claim 1 as amended precludes the possibility of additional mixing being carried out in another step at a temperature which is within the range of 165°C to about 200°C as taught by Lin. The teachings of Lin do not disclose the possibility of carrying out the mixing step at temperatures that do not exceed 130°C and

accordingly, do not render amended claim 1 obvious. This is, of course, because the teachings of Lin do not suggest or imply that the mixing can be carried out without the utilization of a higher temperature within the range of 165°C to about 200°C.

The Examiner also noted that claim 1 did not require a solvent to be present contrary to the arguments made by the applicants in the previous amendment. Accordingly, claim 1 was amended to explicitly state that the cement of the conventional rubbery polymer is comprised of the conventional rubbery polymer and an organic solvent. This amendment is supported by the language at page 6, lines 6-27, of the originally filed specification. Accordingly, this amendment makes it clear that the silica, the silica coupling agent, and the low molecular end-group functionalized diene rubber are dispersed throughout the conventional rubbery polymer in an organic solvent. This is in contrast to the process disclosed by Lin wherein the silica and other ingredients are dry blended into a rubbery polymer. The benefits realized by utilizing the process now being claimed can be seen by reviewing Example 1 and Example 2 on pages 14-16 of the subject patent application. These examples show that the silica/rubber blends made by the process of the subject invention exhibited better physical properties (tan δ, G'50%/G'1%, and M300%/M100%) and required less power consumption to formulate than did the controls which were made by a dry mixing procedure (see Table I and Table II).

As the Examiner has noted, Lin does not disclose the molecular weight of the functionalized diene rubber that is terminated with a tetraalkoxysilane. The Examiner has accordingly cited Asahara to show that the molecular weight of a rubbery polymer treated with tetramethoxysilane had a molecular weight of 70,000.

As was explained in the previously filed amendment, the polymers described by Asahara are block copolymers which are used in pressure sensitive adhesive applications. This type of application is completely different from the uses of the silica/rubber blends of the present invention in rubber products, such as tires. The block copolymers described by Asahara for use in adhesive applications are also very different from the functionalized diene rubbers called for in claim 1. The block copolymers of Asahara are block copolymers that contain styrene, butadiene, and isoprene monomeric units. This is in contrast to the functionalized rubbery polymers now called for in claim 1. More specifically, claim 1 has been amended to call for the low molecular

weight end-group functionalized diene rubber to be a functionalized polybutadiene rubber, a functionalized polyisoprene rubber, a functionalized styrene-butadiene rubber or a styrene-isoprene rubber. These polymers differ from those described by Asahara in that they do not contain both butadiene and isoprene and in that they are random copolymers rather than being block copolymers. In light of these differences, persons having ordinary skill in the art would not equate the block copolymers described by Asahara with the rubbery polymers described by Lin and conclude that they should have the same molecular weight.

Even if the teachings of Asahara are combined with the teachings of Lin, Asahara does not suggest or imply that the functionalized diene elastomer used by Lin in conventional dry blending applications inherently have the same molecular weight. In fact, Asahara indicates that weight average molecular weights of the block copolymers described therein are generally within the range of 100,000 to 400,000 and are preferably within the range of 100,000 to 400,000 (see Asahara at column 4, lines 46-50). Thus, the teachings of Asahara indicate that polymers can be used which have molecular weights that are far over the upper limit now called for in claim 1 (a maximum of 200,000).

Lin is silent with respect to the molecular weight of the polymer used. Thus, a person having ordinary skill in the art could reasonably conclude the polymers used by Lin are of conventional molecular weights. In any case, Asahara explicitly states that polymers having molecular weights well above the upper limit now specified in claim 1 can be used. Accordingly, neither Lin nor Asahara disclose or render obvious the critical nature of utilizing a functionalized diene rubber having a maximum weight average molecular weight of 200,000. The use of a low molecular weight end-group functionalized diene rubber is a critical aspect of the invention now being claimed that is not rendered obvious by the teachings of Lin or Asahara whether viewed individually or collectively. For these reasons the process called for in claim 1 is not anticipated by or obvious in light of the teachings of Lin or the teachings of Lin in view of Asahara.

It is the applicants' position that the teachings of Asahara cannot be properly combined with the teachings of Lin. This is because the teachings of Asahara relate to pressure sensitive adhesive compositions and have virtually nothing to do with the silica-reinforced rubber compositions for pneumatic tires described by Lin. Obviousness cannot be established by

combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting that combination. ACS Hospital Systems, Inc. v. The Montefiore Hospital, 732 F.2d 1572, 221 USPQ 929 (Fed. Cir. 1984). Thus, the teachings of Asahara cannot be combined with the teachings of Lin in the present case since neither of these references suggests such a combination. Persons having ordinary skill in the art would have no logical basis for combining the teachings of Asahara which relate to pressure sensitive adhesives with the teachings of Lin which relate to silica filled rubbery compositions. There is no teaching in either of the cited prior art references that would motivate a person having ordinary skill in the art to combine certain select teachings of the references while ignoring others.[1]

Claims 19 and 20 are allowable on the basis of being indirectly dependent upon claim 1 rather than on the basis of limitations specified therein. The specification and claims now pending in the subject patent application have been amended in a manner that overcomes all objections and the rejections under 35 U.S.C. §103. The subject patent application is accordingly now in a condition for allowance and allowance of all pending claims is now respectfully requested.

Respectfully submitted,

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1 At the time the subject invention was made, persons having ordinary skill in the art would not have piecemealed together the teachings of the references being cited in the manner suggested by the Examiner. Obviousness is not determined by the application of hindsight, or retrospect, with the knowledge of the patentee's discovery. Rather, it is determined as of the time of the invention, based solely on the knowledge disclosed by the prior art as a whole. Republic Industries, Inc. v. Schlage Lock Co., 592 F.2d 963, 200 USPQ 769 (1979); Schnell v. Allbright-Nell Co., 348 F.2d 444, 146 USPQ 322 (1965). A prima facia case of obviousness has not been established. Thus, the claims pending in the subject patent application are not obvious in light of the teachings of the cited prior art references.